

Education

Lady Margaret Hall, Oxford University

2019-
current | MMathCompSci Mathematics and Computer Science
First in Bachelors portion of degree, with 72.5% overall, awarded scholarships for strong performance in each of 1st, 2nd and 3rd years.
Master's thesis titled "Deep generative modelling for encoding Gaussian process priors", supervised by Prof. Seth Flaxman (in progress)

Kingston Grammar School

2012-2019 | 4 A* at A-Level in Mathematics, Further Mathematics, Physics and Latin
12 A* at GCSE

Experience

Department of Engineering, University of Oxford: Research Intern

Summer
2022 | Project title: "Applying lattices & quaternions to the tractability of machine learning for polarisation adaptive optics", under Prof. Martin Booth. We plan to write a paper on our findings in the vacation.
Sought methods to improve ML performance & resource use for detection of polarisation aberrations from measurements, by identifying lattice structures in the cost functions modelled.
Studied optics theory, through textbooks, building simulations and reimplementing papers.

Opsydia: R&D Intern

Summer
2021 | Integrated new laser hardware into R&D optics table, from unboxing and optical path calibration to writing control software and testing it on real diamond samples. Focused on laser power safety, as the laser had no automatic safety features. Discussed my work regularly with team members and communicated with suppliers to solve bugs. Documented my software and presented it to the team.

Tom Rocks Maths: Maths Outreach Intern

Summer
2020 | Wrote, filmed, and edited several videos focused on fractals and 3d printing, aimed at engaging young people with mathematics. Strengthened my communication skills through many iterations of the scripts, with guidance from Dr. Tom Crawford. Won a department prize for my first video.
Built fractals.maxcl.co.uk, including interactive diagrams, to explain Lindenmayer systems (also a video subject), and convert a fractal to a 3D-printable model, using a Rust server to do this efficiently, including processing millions of triangles to achieve smooth curves on the model.

J A Kemp LLP: Intern

Summers
2018, 2019 | Developed software to automatically file legal requests, incl. generating supporting documentation; and to compare internal data to those held by EU patent offices, working with lawyers throughout.

Skills

Leadership and organisation

President, Oxford Millennium Orchestra | Ran an orchestra of ~70 players from the university and city, restarting it post-COVID by recruiting >30 new players, and organising two very successful concerts in the Sheldonian Theatre. Ran concert logistics with venue staff; sourced and organised thousands of pages of sheet music; and managed weekly rehearsals to ensure we were well prepared for concerts. Modernised ticketing system to allow easy payments with cards & online, resulting in record sales.

Communication

Department Ambassador | Helped students on a school visit to the Maths Institute with a range of extension problems, worked at the Oxford Maths Festival welcoming and registering families, and answered and moderated questions on virtual open days.

Debating | Vice-president of school debating society, took part in many debates against students and alumni, spoke in front of large (roughly 1,000 people) and small audiences, with and without preparation.

Writing

Essay prize | Joint first prize in the Corpus Christi, Cambridge Languages and Linguistics essay prize, writing about voice assistants and their command of language.

EPQ Level 2 | Wrote a 2,500-word essay on the USSR's space program and the effect of politics and culture upon its success and received an A*.

Personal Projects & Interests

Music | Grade 8 Distinction on cello and a dedicated member of an award-winning youth orchestra for 7 years, including leading my section, and now a university orchestra, which I organised for a year.
Committed member of LMH chapel choir throughout my time at Oxford, and also recently Jesus College choir.

Software for Latin A-Level | Wrote software to annotate Latin texts using an interactive web UI for colourful word-by-word annotation. Successfully used throughout my A-Level, in class and for revision, resulting in an A*. Sourced the texts from the Perseus online classics project.
Developed a vocabulary tester designed specifically for Latin grammar, using data parsed from Wiktionary data files.

Budgeting software | Created a personal budgeting system with automatic transactions imports using Open Banking.
Learnt about budgeting and accounting practises to design UI.
Used Twilio to send updates about recent transactions and answer basic queries about budgets.

AI and robotics | Built a small autonomous robot on a week-long spring course and learnt about and implemented a variety of common algorithms in Machine Learning on another course about AI.
Experimented with robotics using a small rover, with particular interest in using a LiDAR sensor to map out its surroundings, by 3D printing mounts for it on a stepper motor for 360° rotation